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Row Spacing and Nitrogen Rate in Wheat, How Wide Can We Go?

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Why the interest in wide row spacing?

No-till

- **No-Till means working with standing stubble and surface residues**
- **Surface residues create unique challenges at seeding**

- **No-till and Narrow spacing = more openers, more draft, more energy, more costs, more maintenance, more residue clearance problems, narrower seeders, longer seeding periods**

Questions of Interest

- **Can we go beyond 12”?**
- **What are the implications for side-banded nitrogen fertilizers?**

Experimental Design

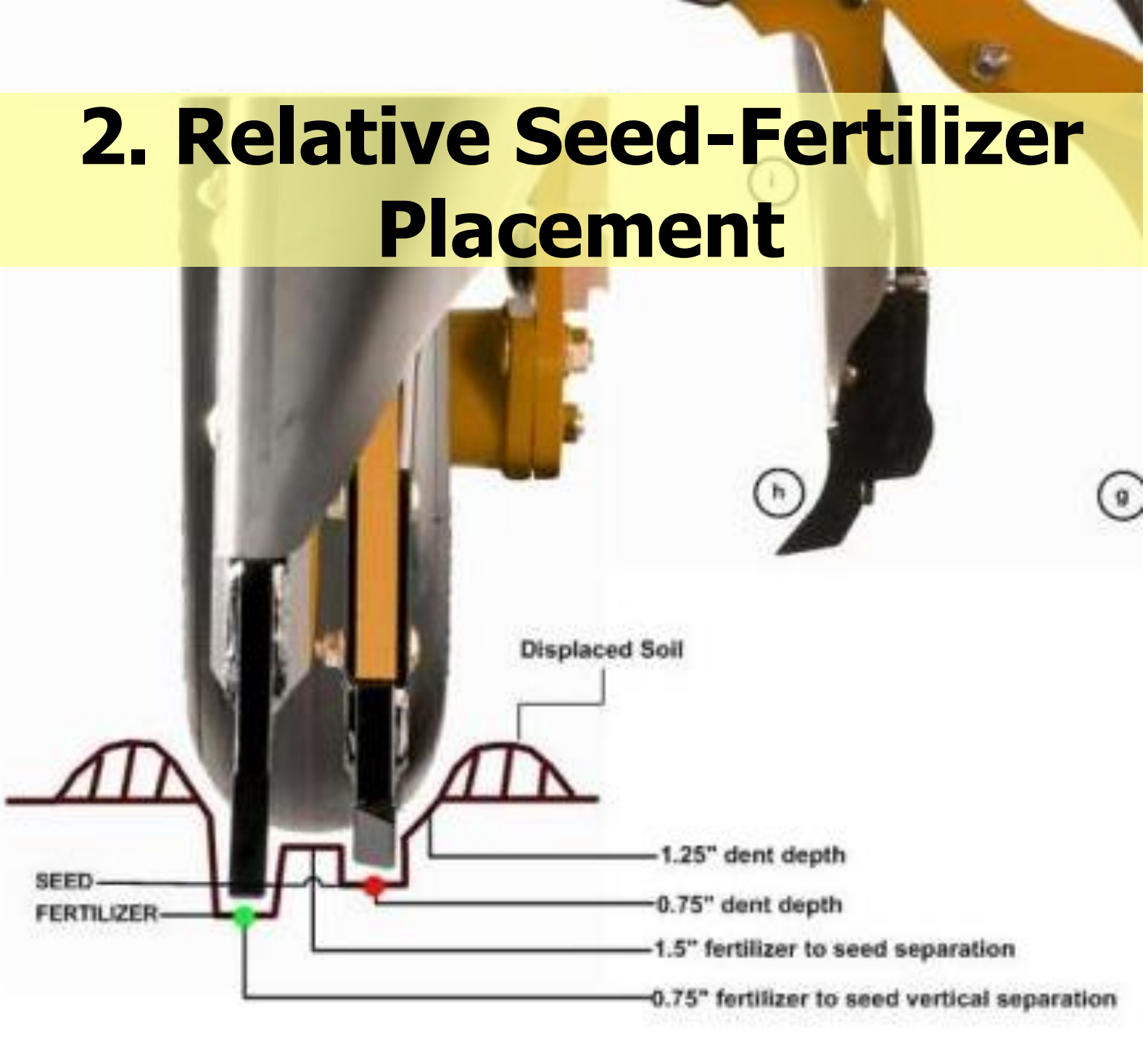
- Split plot design with 4 reps
- Main plot: Row width
  - 10”, 12”, 14” and 16”
- Sub-plot: Nitrogen rates
  - 20, 40, 80, 120 and 160 kg N/ha
- Proc Mixed with Year as a fixed effect

Experimental Design

- **4 Years: 2013 to 2016**
- **Crop: wheat (target plant population 300 plants per meter square)**
- **One blend of 14-20-10-10**
  - **142 kg /ha (127 lbs/acre)**

8 SeedMaster Openers on Two Ranks

2. Relative Seed-Fertilizer Placement



Fertilizer Products (lbs/acre)

N rate kg N/ha	14-20-10-10 lbs/acre	Urea lbs/acre	Total lbs/acre
20	127	0	127
40	127	39	166
80	127	116	243
120	127	193	320
160	127	271	398

Row Spacing

46-0-0

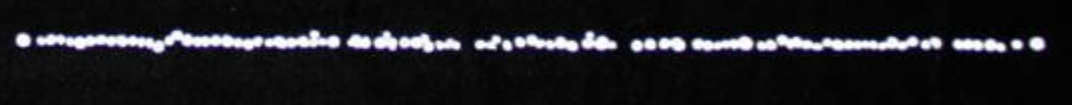
60 kg N/ha

Actual Urea Product per foot of Row

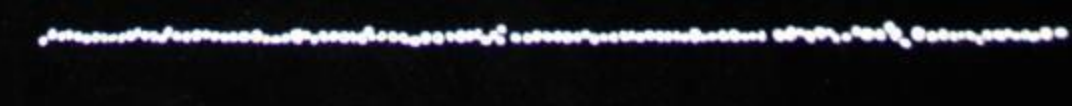
10"
(25 cm)

12"
(30 cm)

14"
(36 cm)



16"
(41cm)

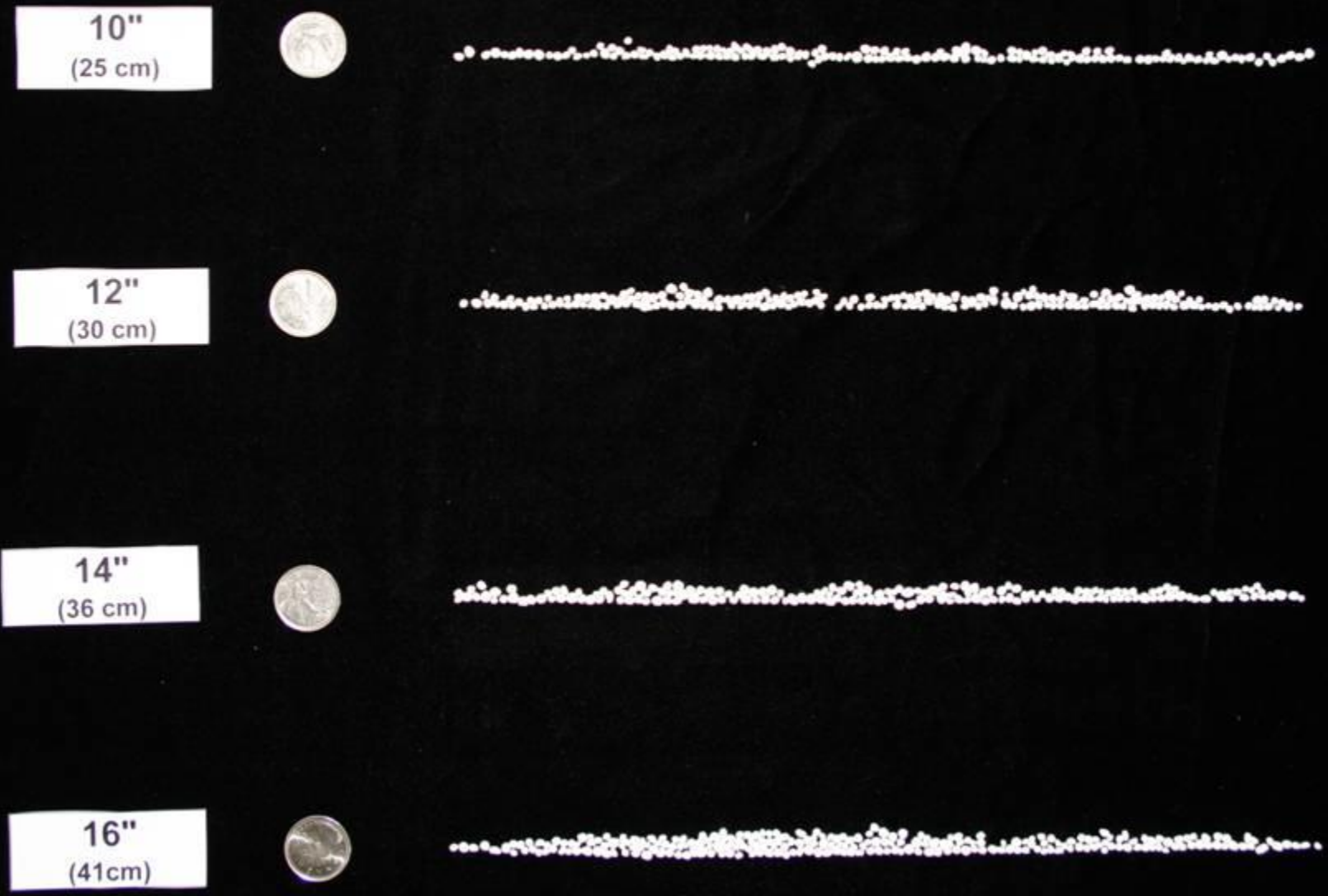


46-0-0

120 kg N/ha

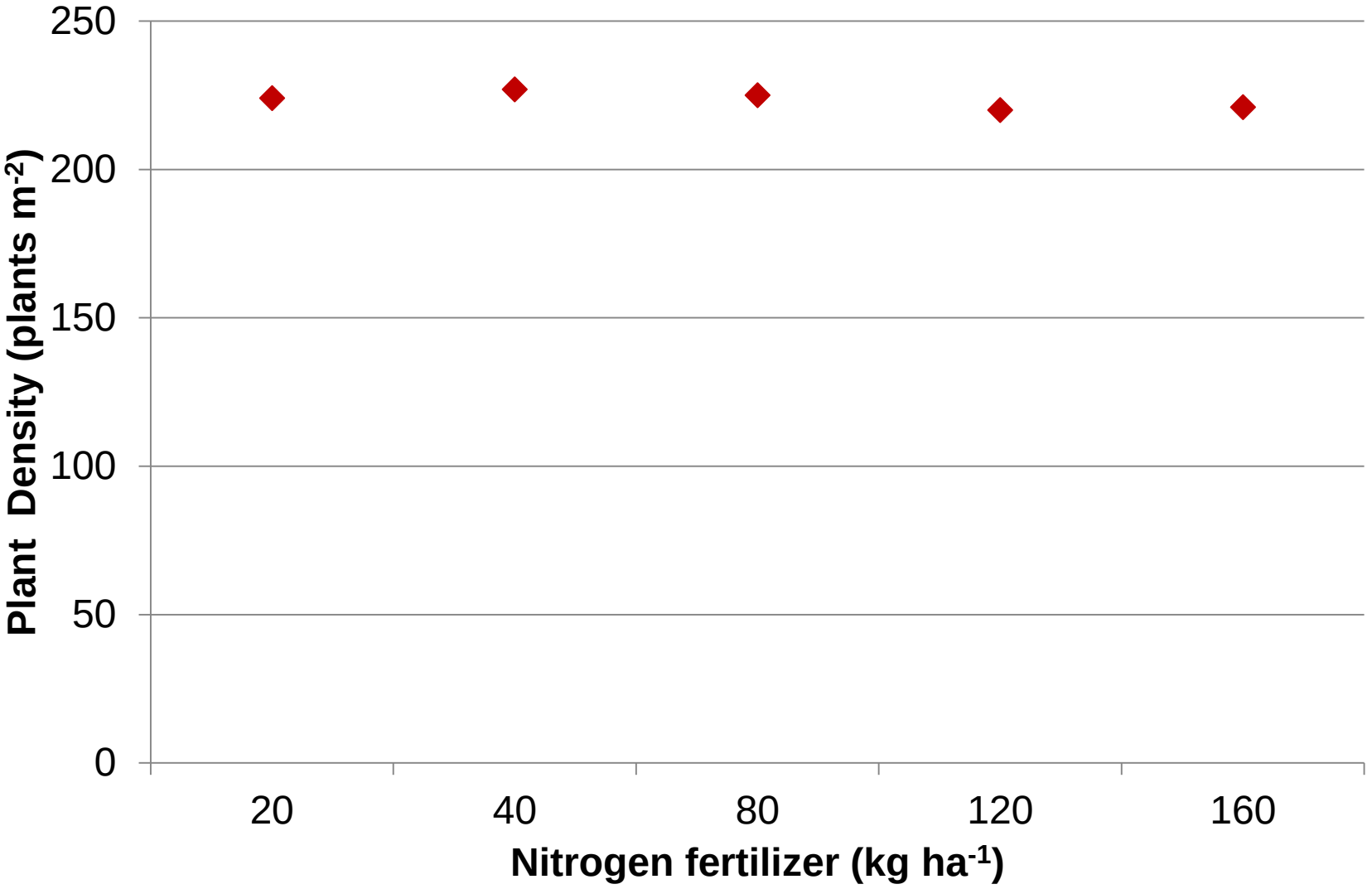
Row Spacing

Actual Urea Product per foot of row

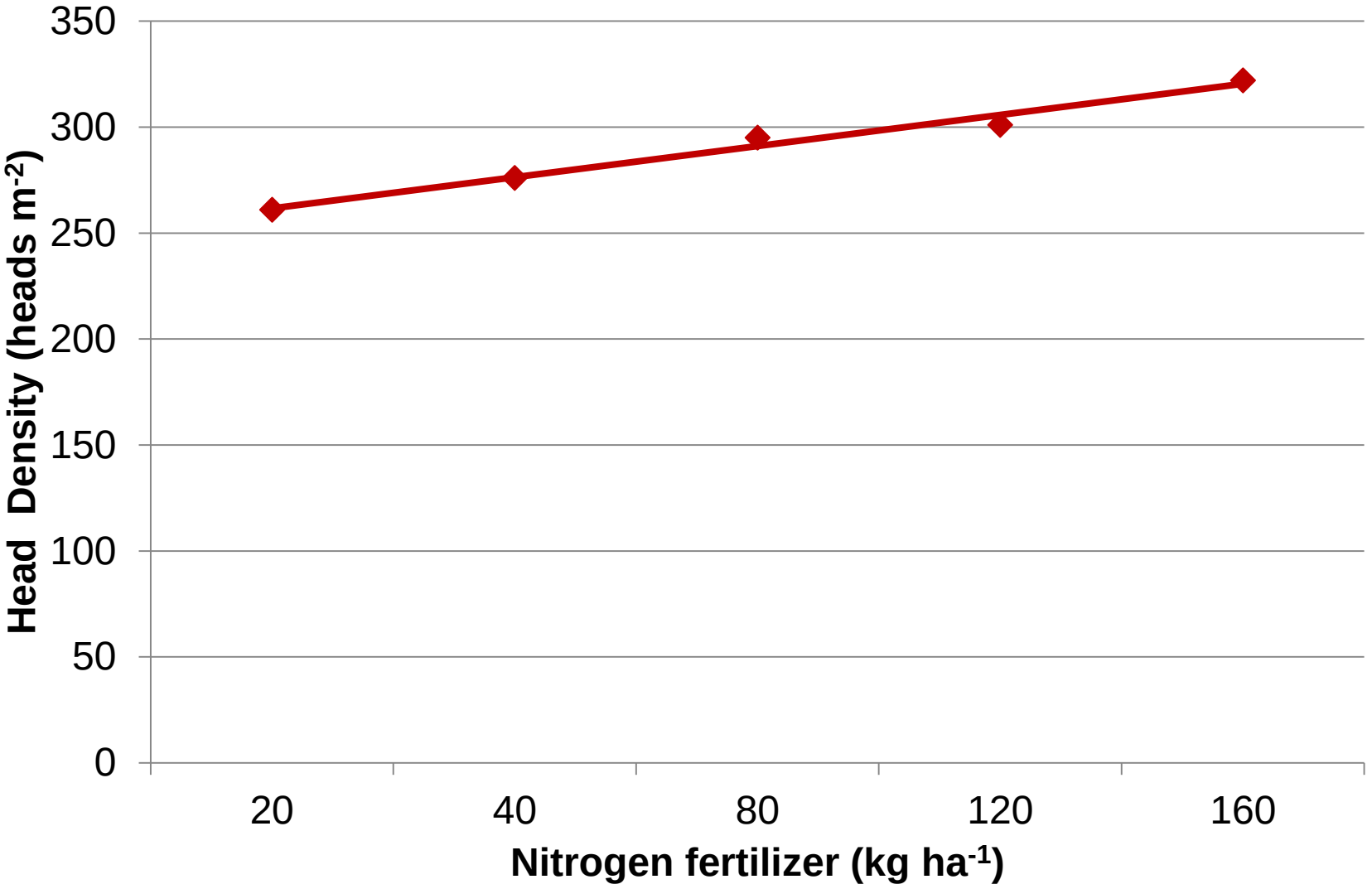


Results

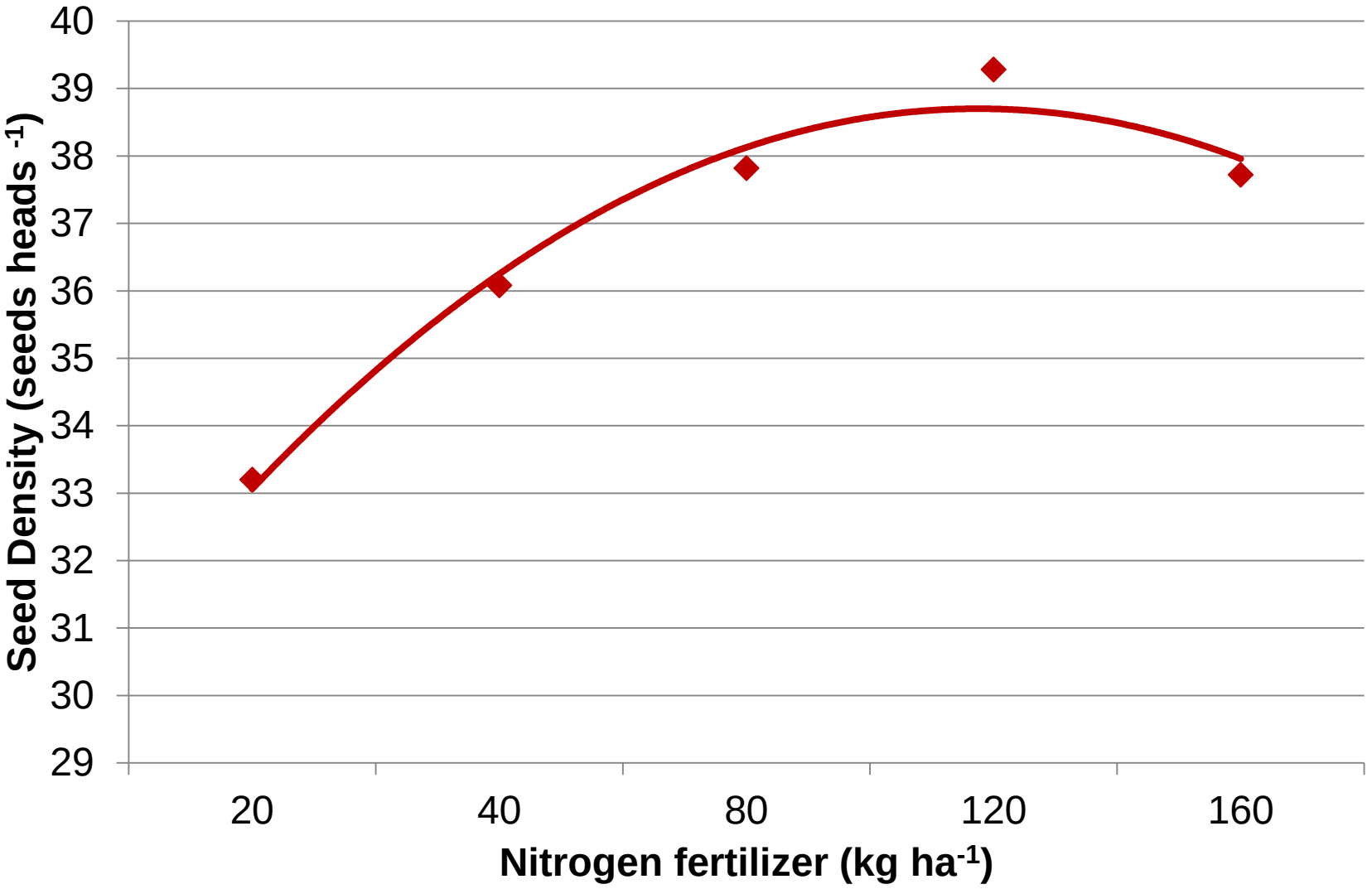
Nitrogen Rate Effects on Plant Density



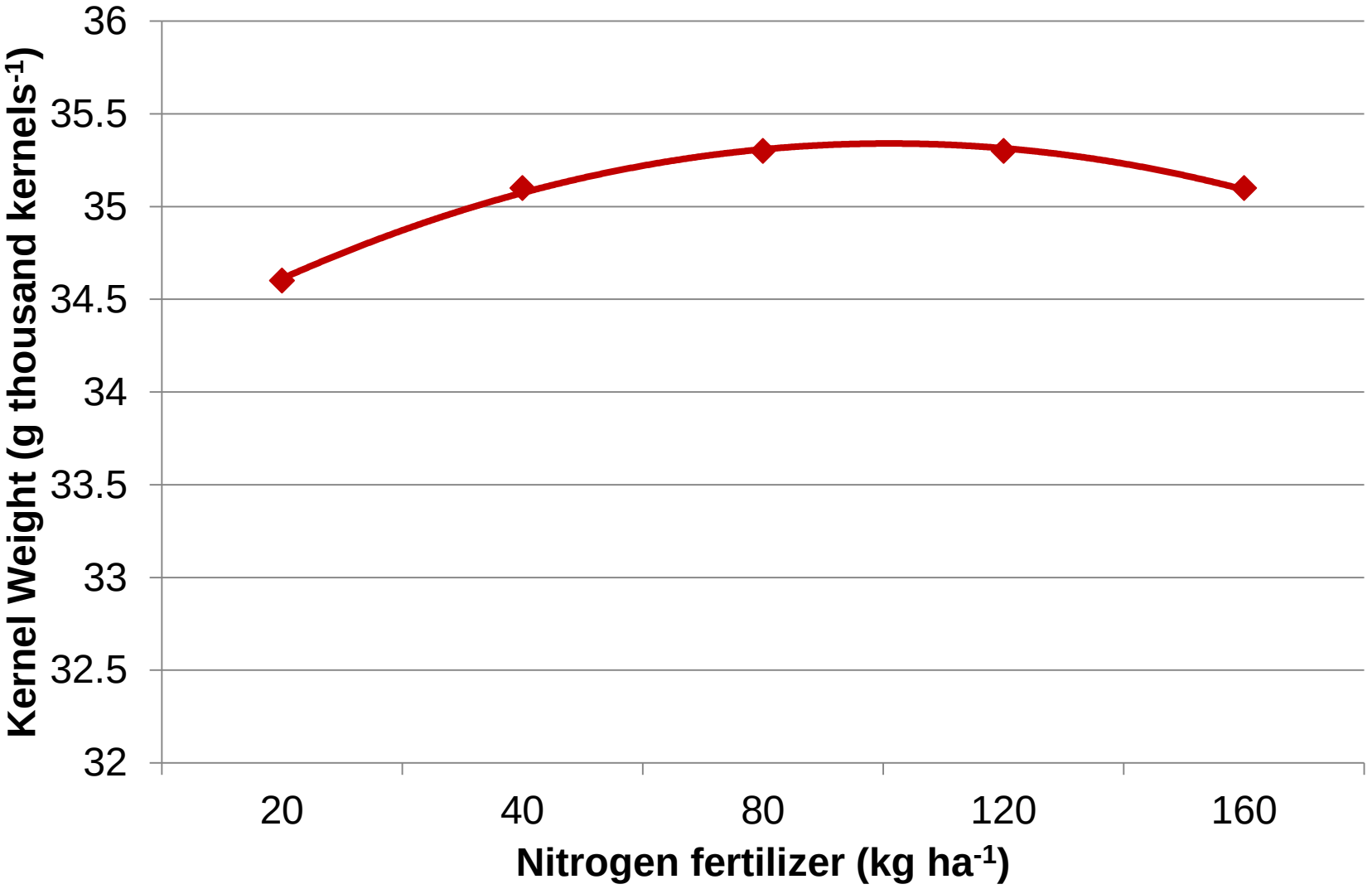
Nitrogen Rate Effects on Head Density



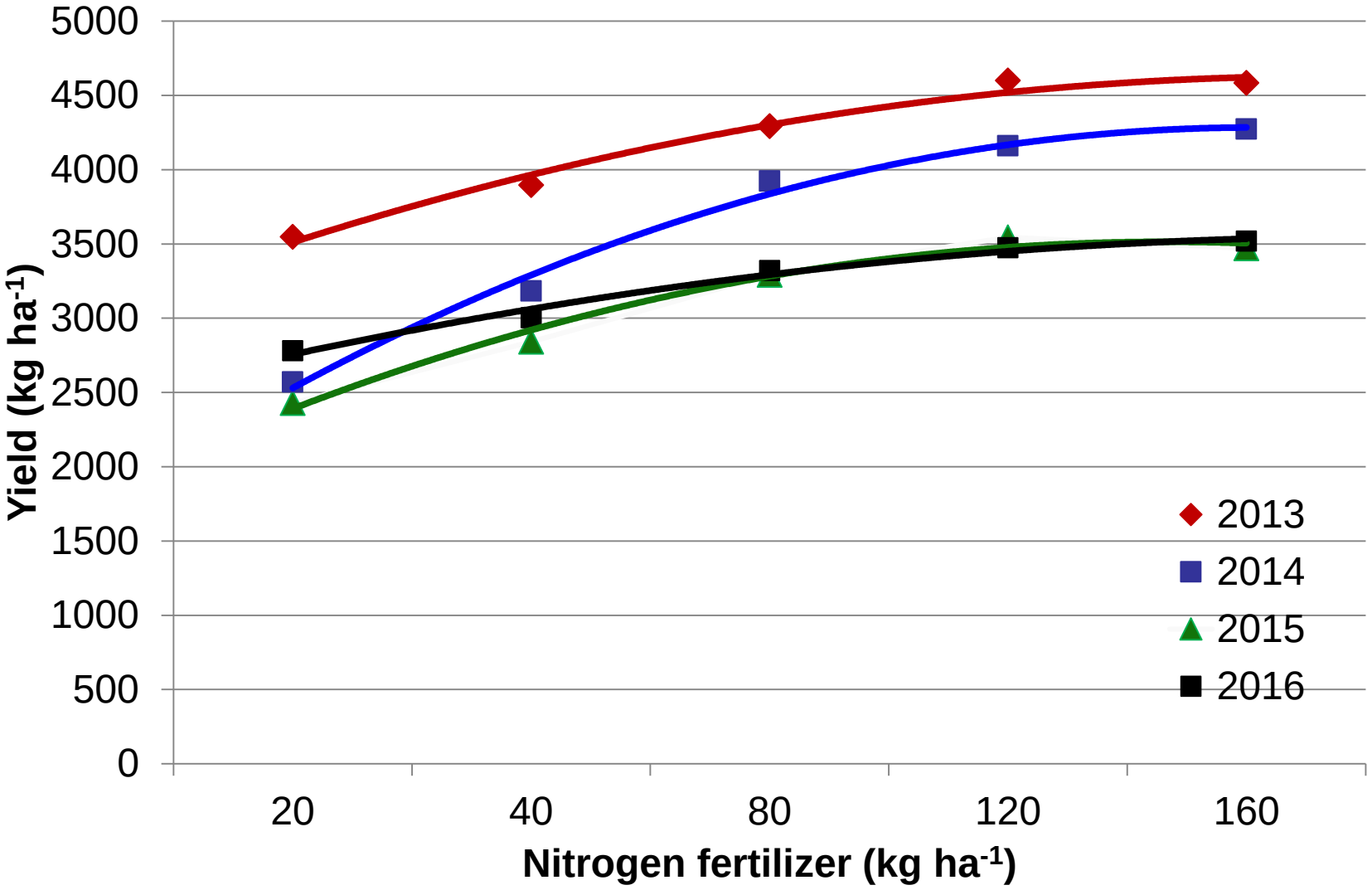
Nitrogen Rate Effects on Seed Density



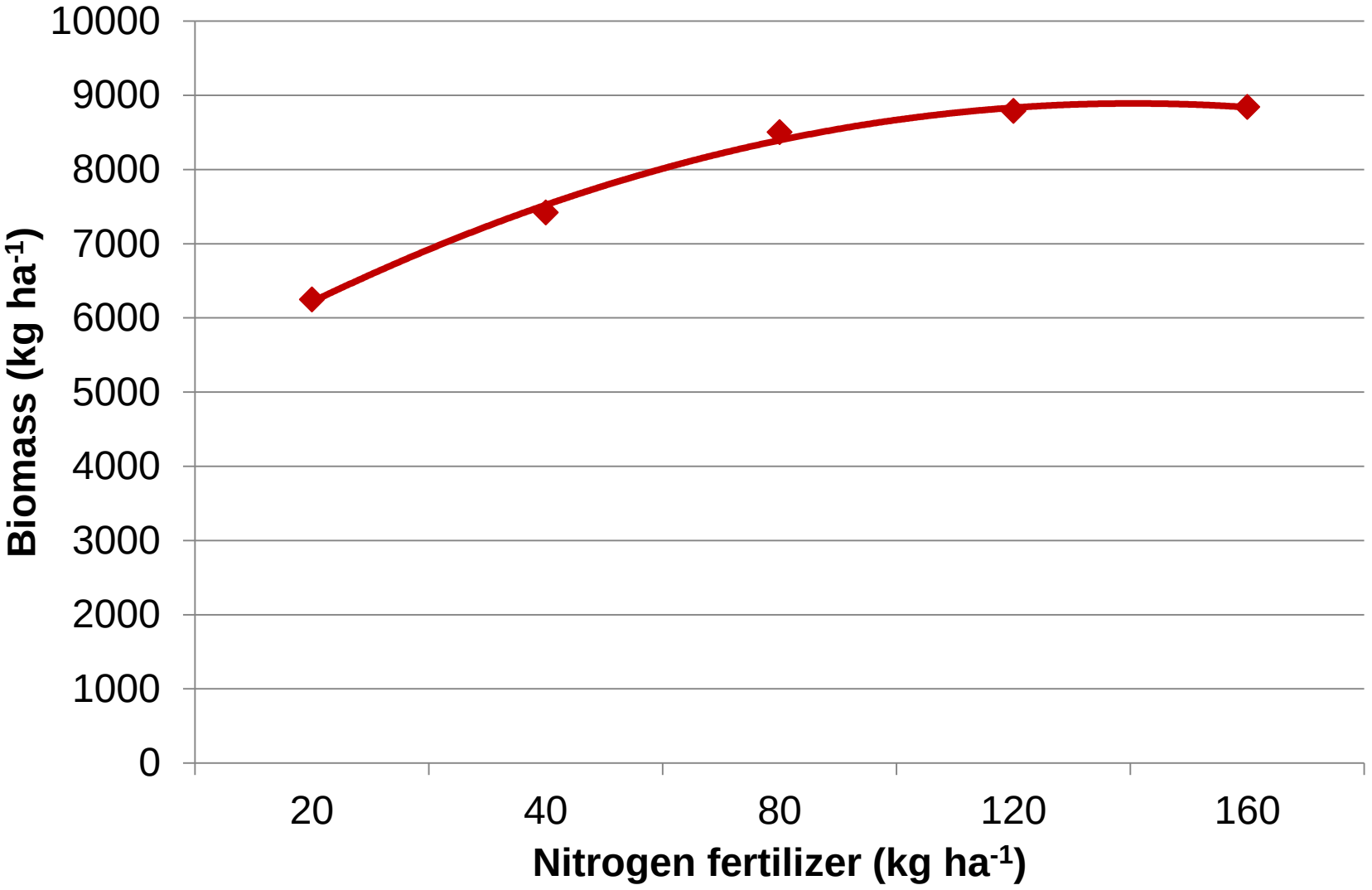
Nitrogen Rate Effects on Kernel Weight



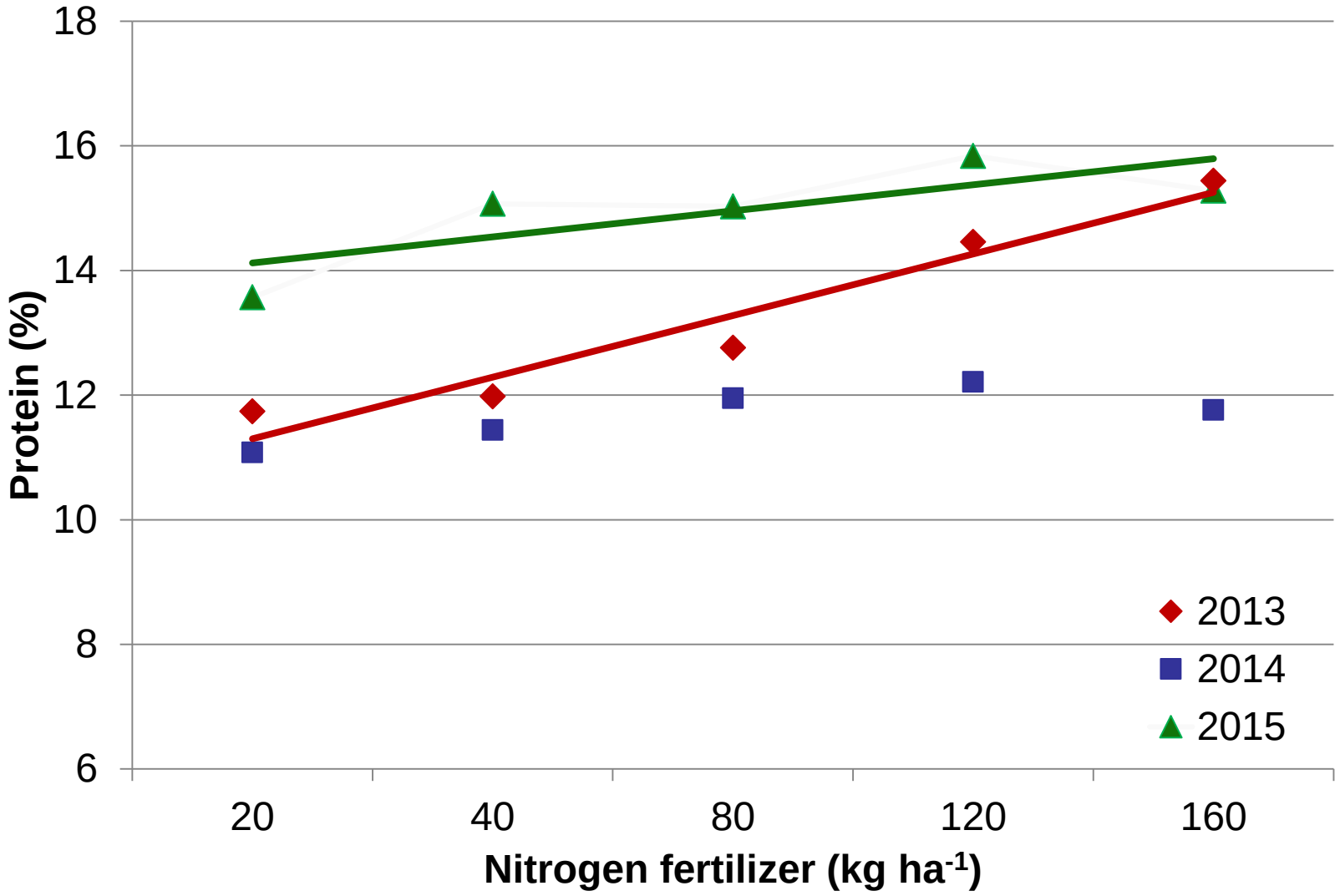
Nitrogen Rate Effects on Grain Yield



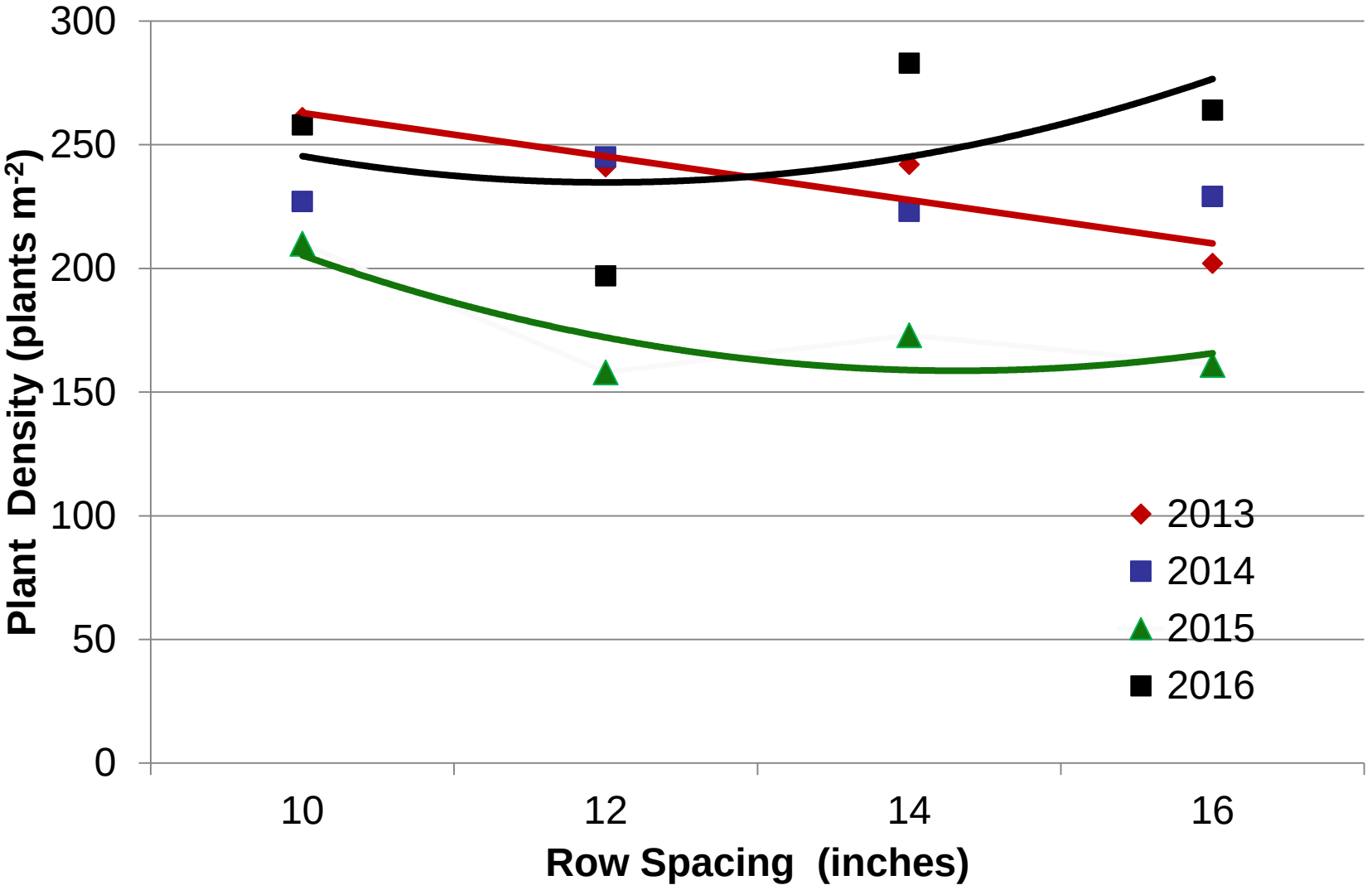
Nitrogen Rate Effects on Biomass



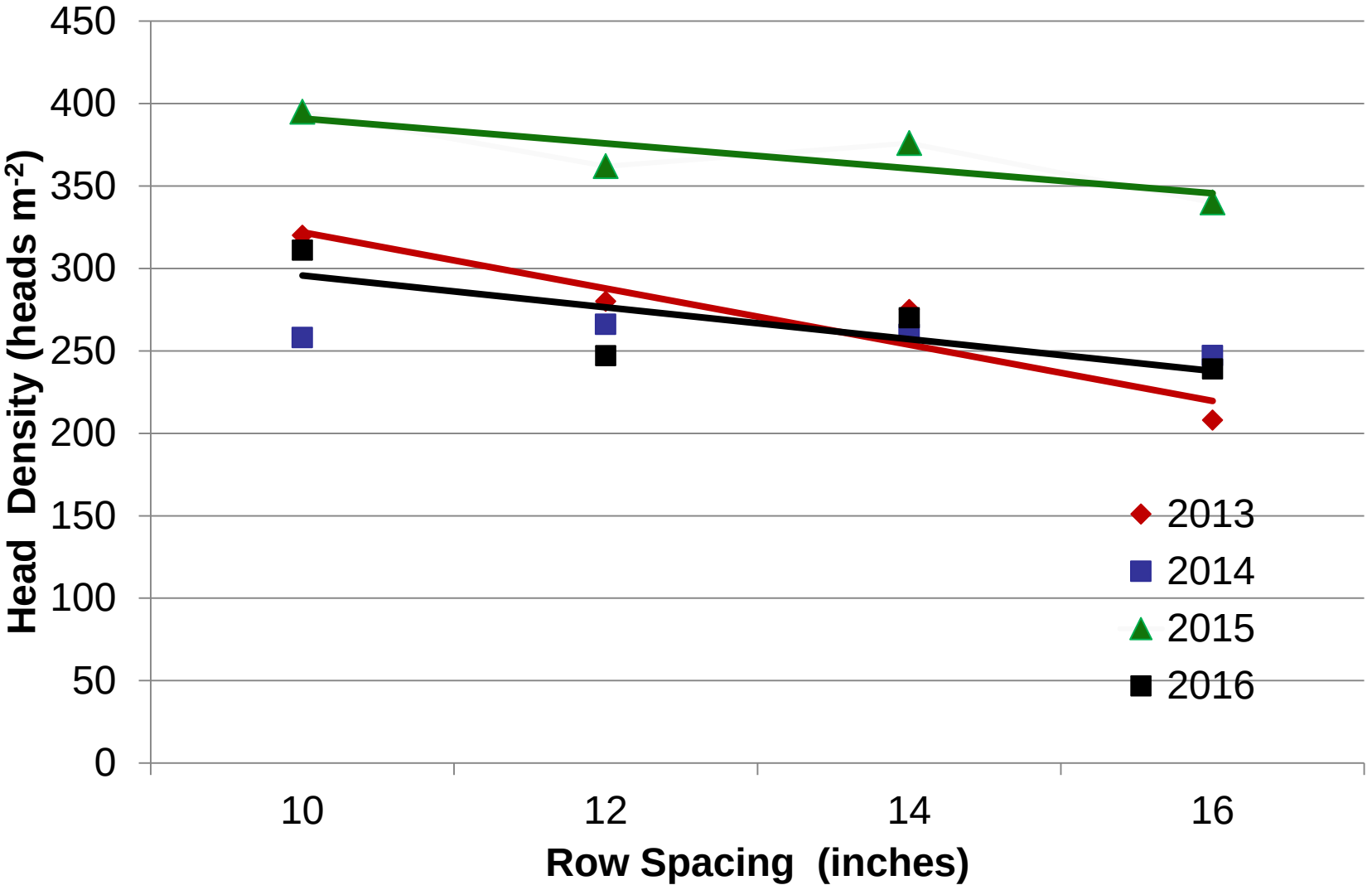
Nitrogen Rate Effects on Grain Protein



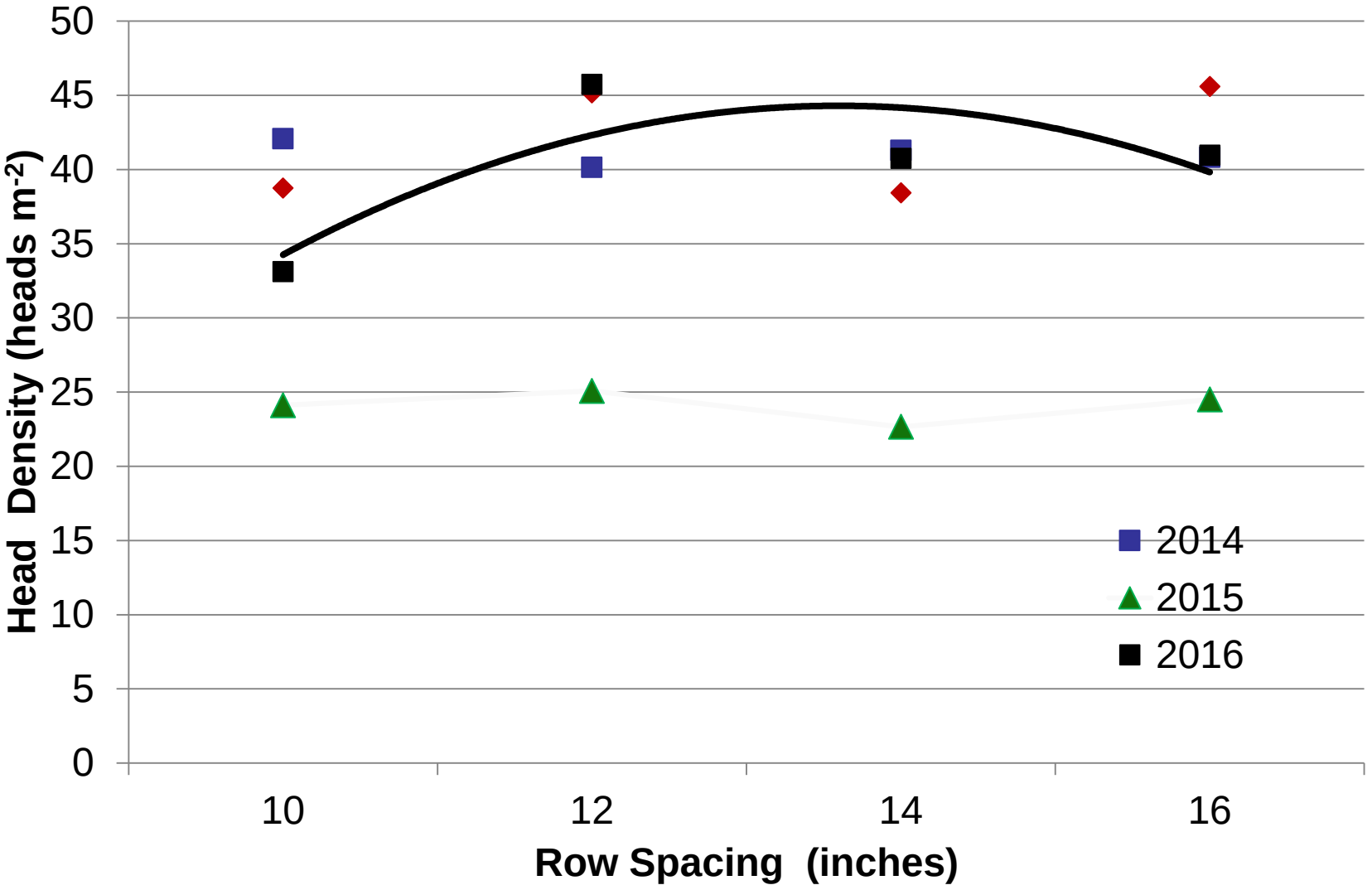
Row Spacing Effects on Plant Density



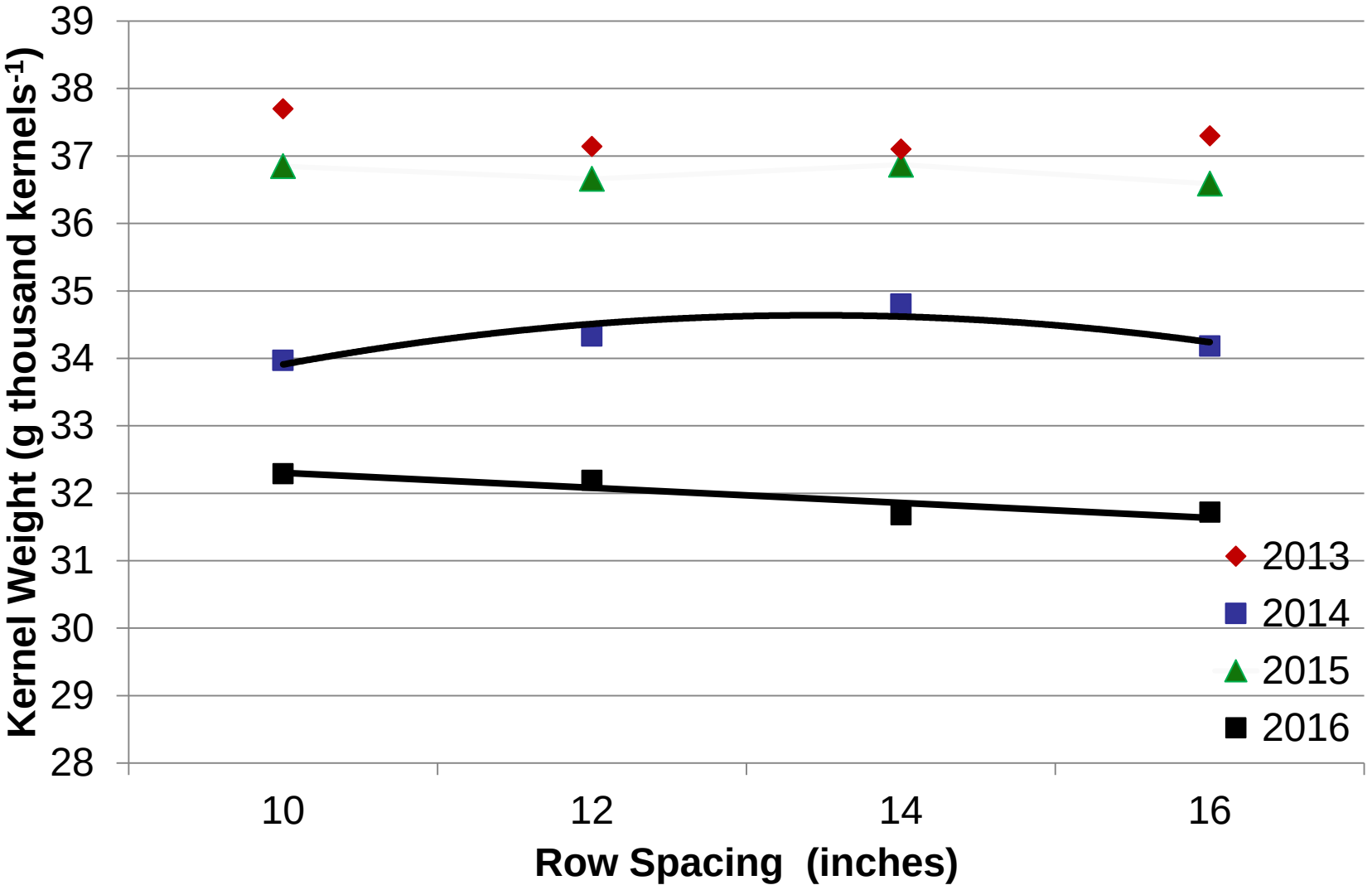
Row Spacing Effects on Head Density



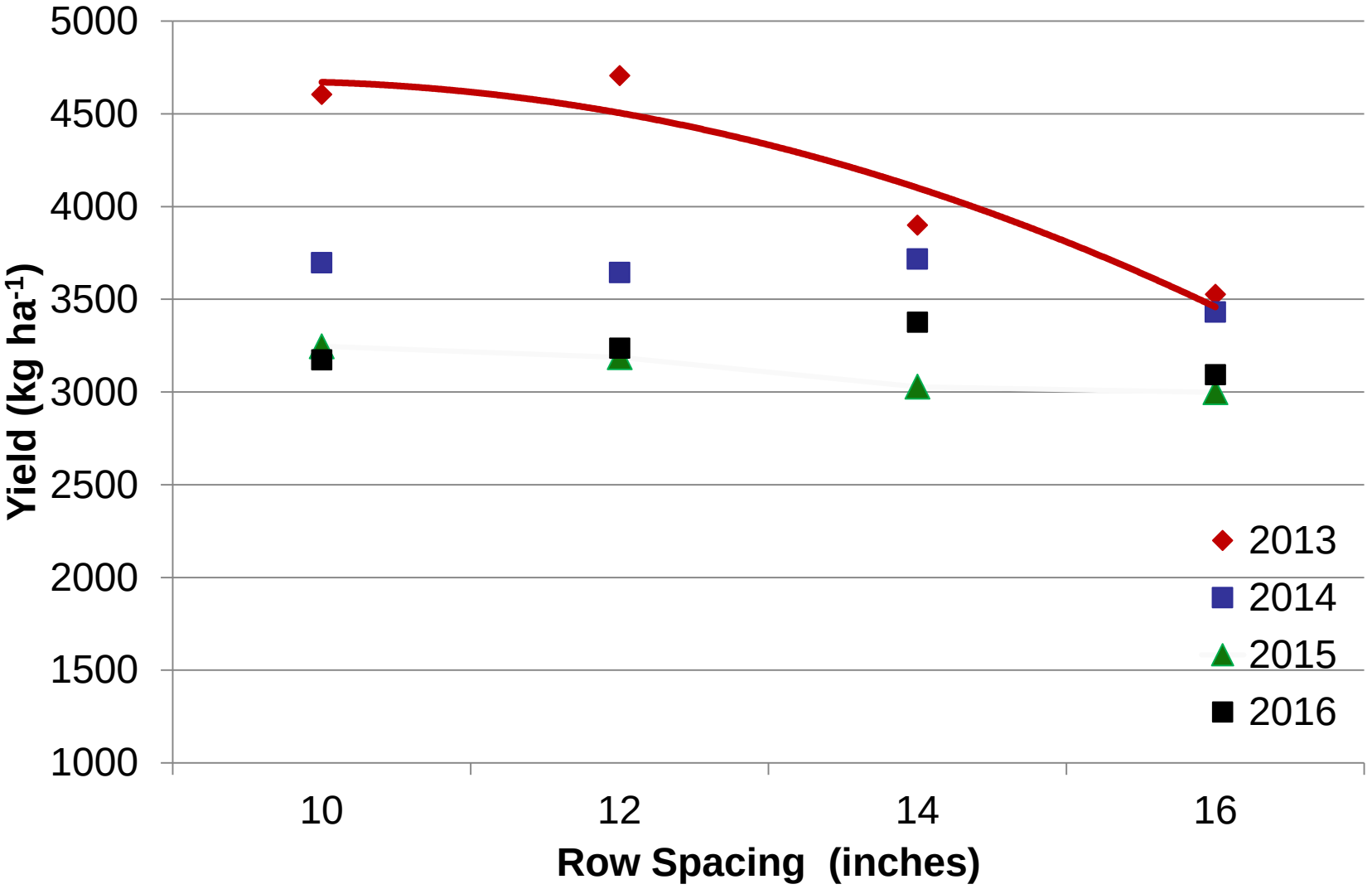
Row Spacing Effects on Head Density



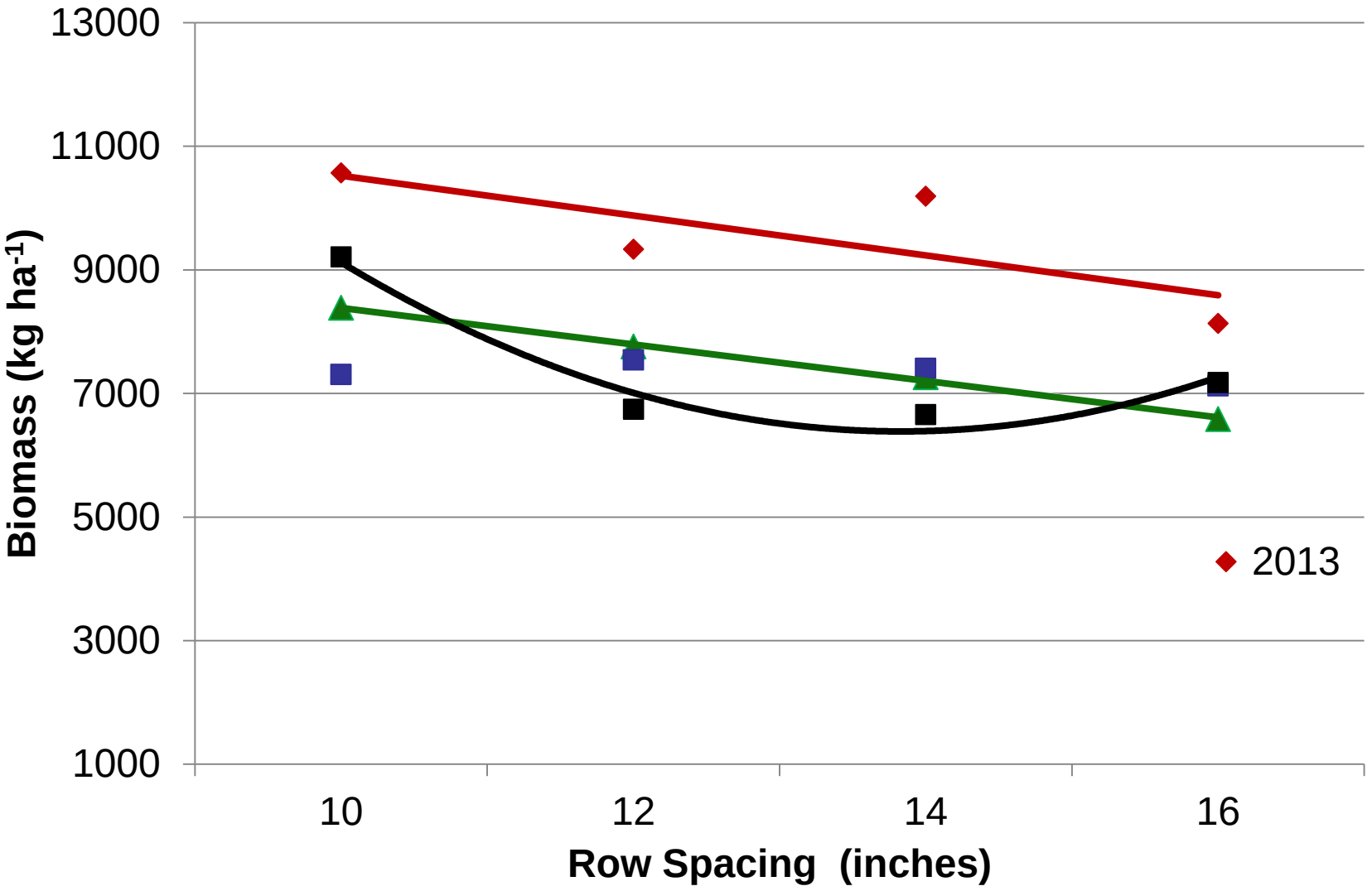
Row Spacing Effects on Kernel Weight



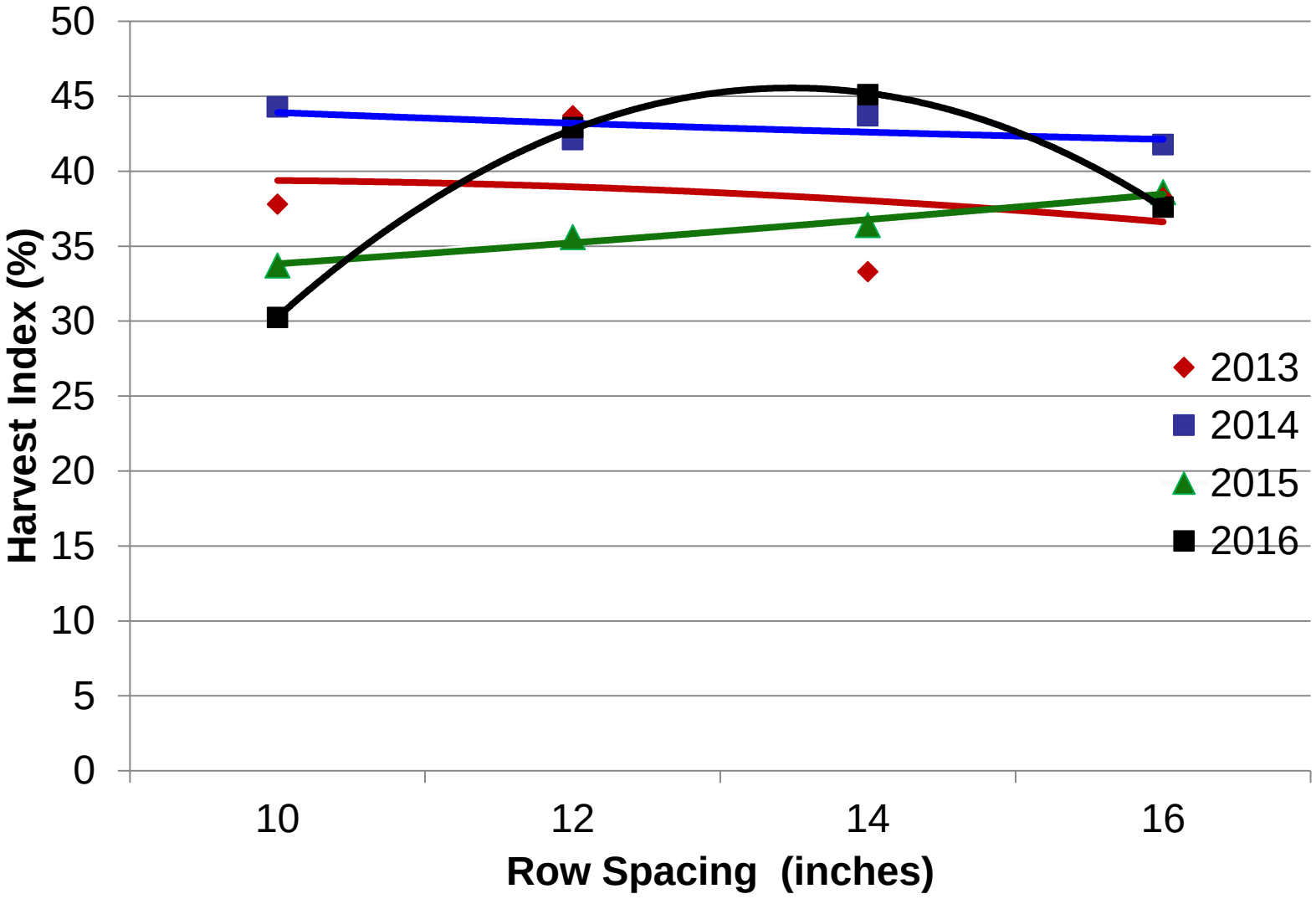
Row Spacing Effects on Grain Yield



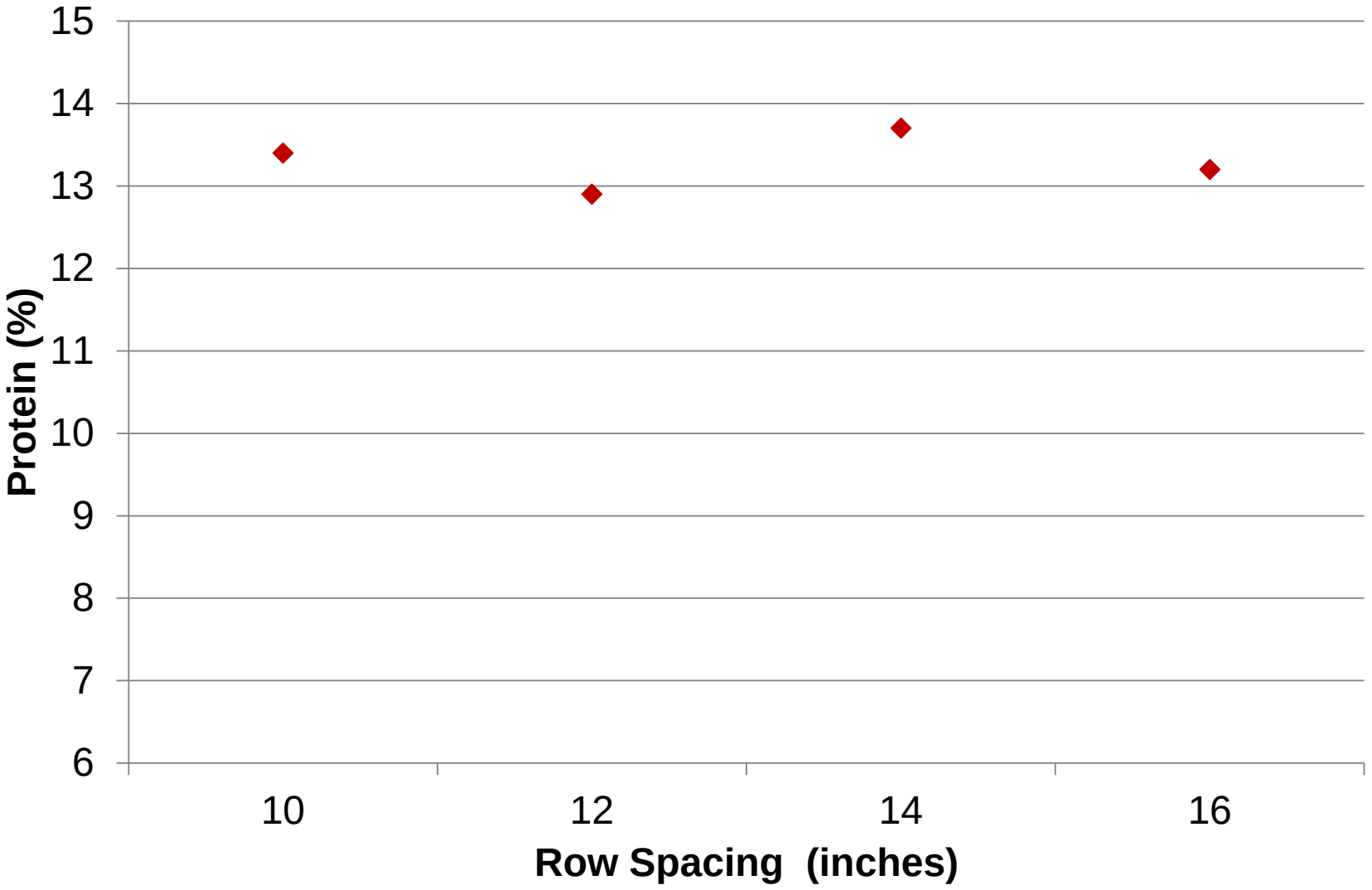
Row Spacing Effects on Biomass



Row Spacing Effects on Harvest Index



Row Spacing Effects on Protein



Conclusions

- **N rate had no effect on plant population indicating that fertilizer placed 1.5″ to the side and ¾″ below the seed is a safe configuration**
- **No interaction between N and row spacing**
- **Row spacing – one year strong decrease in yield as the row width increased**

Limitations

- **One location – Indian Head**
- **One cultivar _ Goodeve**
- **One soil - clay**


Thank-you